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# Little Pressure for "Super Farms"

## in Iowa

Any rapid trend toward "super farms," according to this most recent study, would call for greater cost economies from size than appear to exist at the present time. Most such economies are realized within the 300-acre range.

by Raymond R. Beneke and Jack M. Alexander

WITH AVERAGE farm size still increasing in Iowa, there's some concern that really big "super farms" will crowd in and take over. But the best evidence we have indicates that this just isn't in the cards unless there are striking new developments in machinery designs.

Past studies showed that most of the economies in crop production possible through farm size are realized with about 300 crop acres. They showed that cost advantages with more acres than this were quite small. Yet, there are a number of very large farms—950 crop acres or more—in the state.

Recently we analyzed the costs on some of these very large farms to check for possible economies that might have been overlooked in the earlier studies. Results, however, largely confirm the find-

ings of the past studies—that farms in the 300- to 400-acre range are large enough to achieve most of the economies that can arise from size alone at the present time.

### What We Did . . .

First we located all farms within the cash-grain area with 950 or more crop acres. We considered only farms that carried on typical commercial farming operations, supervised by one manager and using labor and machinery interchangeably among units. Thus, if an operator had two units totaling 950 acres but farmed them separately, we didn't study his operation. We found 10 farms meeting all of the characteristics we were looking for. From these, we collected data on machinery and labor use, cropping practices and costs.

For comparisons we needed "benchmarks" against which we could measure the performance of the very large farms. So we selected three groups of 10 farms

each with accounting histories suggesting well-managed operations. The first group of 10 ranged from 145-180 acres; the second, from 295-330 acres; the third, from 420-620 acres. For brevity, we'll call these groups 160-, 320- and 500-acre farms, respectively—pretty much the way they actually averaged out—and the very large farms, 1,000-acre farms.

We worked with two measures of machinery efficiency for each farm: (1) the machine and power investment per \$100 of crop output and (2) machine and power cost per \$100 of crop output. We also estimated labor cost per \$100 of output, using an arbitrary charge of \$1 per hour for all labor whether operator, family or hired labor. Machinery was valued at *current market prices on the used market* rather than at the operators' inventory values. Changes in machinery prices and differences in depreciation methods used on the farms made accurate cost comparisons on the basis of depreciated "book" values impossible.

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## What We Found . . .

**Machinery Investment:** We found two important differences in the machinery arrangement between the very large and the three smaller groups of farms.

(1) The large farms made much greater use of large, high-capacity machines. The makeup of the machinery inventory on a 1,000-acre farm was quite different than you'd find on two 500-acre units. Crawler-type tractors, self-propelled combines and pickers, and 4- and 5-bottom plows weren't often found on the three groups of smaller farms. But they were common on the 1,000-acre units studied.

(2) The machinery used on the 1,000-acre farms was newer than on the smaller farms. Operators of the large farms said they preferred newer machinery because it reduced the risk of delay from breakdowns in field operations. Because of their large acreage, the operators felt the pressure of field work more keenly than the operators of typical smaller farms.

Even with larger and newer machinery, the operators of the 1,000-acre farms were able to keep their machinery investment per \$100 of crop output lower than found on the smaller farms (see chart and table). Notice that the 320-acre farms appear to have an advantage over the 500-acre group in this and the several comparisons that follow. But the differences are so small that they could have arisen merely by chance from the farms chosen. Total crop machinery investments for the four size groups averaged as follows: 120 acres, \$4,153; 320 acres, \$6,372; 500 acres, \$10,615; 1,000 acres, \$20,039, all on the used market basis.

**Machine and Power Cost** per \$100 of crop output is another measure of efficiency used in the study. Investment per unit indicates the amount of capital tied up. Cost includes yearly depreciation, interest on investment and the taxes and insurance involved in owning and using the machinery in production. We found that the 1,000-acre farms have an advantage in machine and power

cost, too. But it's quite small—about 33 cents per \$100 of output below the 320-acre farms.

**Add Labor Costs:** The third efficiency measure we used summed labor and machinery costs. In this case, the 1,000-acre farms didn't show up quite as well. Costs on the 1,000-acre farms per \$100 of output were slightly higher than on the 320-acre farms but about \$6 lower than the 160-acre group and about \$1 less than the 500-acre farms.

This higher cost on the 1,000-acre farms seems to come out of their inability to use labor as efficiently as the 320-acre farms. The time to prepare for and perform crop operations on the 1,000-acre farms per rotated acre averaged 4 man-hours, even with the high-capacity machinery. This compares with 3.7 man-hours on the 320-acre farms and 3.4 on the 500-acre farms.

Our estimates of labor requirements include only the time that could clearly be charged to crop enterprises. They don't include indirect requirements such as fixing fence, repairing machinery and buildings, and getting materials. Any time spent by the operator or manager in supervising hired help on cropping operations, however, is included.

**Labor Problems:** Operators of the 1,000-acre farms thought that the most difficult problem they faced was in maintaining an adequate labor force—particularly with respect to seasonal changes in labor requirements. Most Corn Belt farm operators have this problem. But when the bulk of the labor is supplied by the operator and his family, most of the seasonal variations can be met by varying the length of the working day.

Operators of the 1,000-acre farms regarded year-around hired help as the most dependable. But they couldn't arrange a farming program to meet peak loads and still keep hired help fully employed at all times. Though most of the operators found hired help willing to lengthen their working day to some extent in pressing seasons, most also found it necessary

to depend heavily on day labor and hourly help.

Supervising hired help seemed to be a critical problem on the 1,000-acre farms. Operator time used for supervision ranged from 25-60 percent. And even then, most of the operators felt that machinery repair and maintenance was considerably higher than if they had serviced and operated the machinery themselves. They emphasized that their labor turnover was high, requiring considerable time in hiring new workers. One of the 1,000-acre farm operators reported there had been 10 times in the past 3 years when workers had quit at a critical time.

The 1,000-acre operators have developed several devices for maintaining more stable and effective working forces. Among those mentioned: bonuses, provisions for days off, more extras and better housing than available on other farms, and paying higher-than-average wages.

**Field Operations:** The fact that the operators of the 1,000-acre farms were farming more land and were more often pressed for time is reflected in several differences in field operations as compared with the three groups of smaller farms:

- The proportion of hay acreage was somewhat lower and the soybean acreage higher. This reflects a shift from a crop where timing is critical and labor requirements high to one where timing is more flexible and labor requirements lower.

- More fertilizer was plowed down rather than used as starter or side-dressing. The plow-down method took less labor and typically shifted the job to a season where competition for labor and managerial supervision was less severe.

- Corn planting was speeded by power checking. On the 1,000-acre farms, 75 percent of the corn acreage was power checked, compared with 40 percent on the 160-acre farms.

- Hay was less frequently cut a third time. On the smaller farms, 62 percent of the hay acreage was cut three times, compared with 27 percent of the hay acreage on the very large farms.

- Corn was cultivated less often on the 1,000-acre farms. All of the farms typically cultivated corn at least twice. But 60 percent of the corn on the smaller farms was cultivated three times, compared with 35 percent of the corn on the very large farms. The large farms also made greater use of rotary hoes

and chemical spraying for weed control.

**Total Output:** Because of attempts to “cut corners,” crop yields per acre on the 1,000-acre farms averaged slightly lower than on the smaller farms. But the lower yields were offset by some shifting from hay and oats to corn and soybeans on these farms in the cash-grain area.

Several factors probably account for this shift. For one thing, livestock operations on the 1,000-acre farms were limited in relation to total crop acres. The large farms could raise ample hay and pasture with a relatively low percentage of their land in these crops. Less emphasis on hay and pasture meant that a smaller percentage of their land needed to be in oats to serve as a companion crop. Another reason: Corn and soybeans fitted better into large-scale farming where labor is a problem. These two crops lend themselves more fully to mechanization than does hay.

The dollar volume of crop output per crop acre was remarkably similar on all of the farms studied. This is mainly because the lower per-acre yields on the very large farms were offset by more intensive row-cropping.

**Other Differences . . .**

The comparisons so far among costs, output and practices have been for the averages of the 160-, 320-, 500- and 1,000-acre farms. But there were also some striking differences within the groups—especially within the very large farm group.

The 1,000-acre farms had a much wider range in machine cost, labor requirements and total output per acre than did the other groups. This may have resulted partly from the way in which the farms were chosen. The 1,000-acre farms represented *all* of the farms of this size we could locate in the cash-grain area. The “benchmark” groups of smaller farms were *selections* of efficient farms in the same area.

The 1,000-acre farms as a group showed little advantage in machinery and labor expense per \$100 of crop output on the average for the

1,000-acre group was raised particularly by several of the 10 operators who had very high costs. At the other extreme, the most efficient operations in the 1,000-acre group did show a substantial cost advantage over the best operators in the benchmark groups.

Of the 1,000-acre farms, those that had the highest machinery expense per \$100 of crop output also tended to have the highest labor costs. You might expect that more investment in machinery and higher machine costs would permit the operators to reduce their labor costs. But the operators who had difficulty in holding down machine costs seemed also to have difficulty in making efficient use of labor.

Apparently the quality of management becomes more critical as the size of the farming operation increases. Large-scale farming permits a highly skilled manager to fully use his talents. But it also invites more and costlier mistakes if he must spread his management too thinly.

**Economies Too Few . . .**

On the very large farms that we

studied, the economies found are clearly insufficient to exert much pressure to push farm size into the 1,000-acre range. The best operators of the 1,000-acre farms did achieve lower cost than did the best operators among the smaller 160-, 320- and 500-acre farms. But most of the very large units came out no better, and some were considerably less efficient, than the smaller farms.

Few individuals can acquire the capital necessary to gain control of enough resources to farm 1,000 acres. Buying or renting this much land all within a reasonable distance presents another problem. And the seasonal nature of farming complicates the maintenance of a dependable labor source.

Thus, any rapid trend toward 1,000-acre farms would call for greater cost economies than appear to exist to overcome the obstacles just mentioned. Changes in machinery design and in methods of financing could change the picture. But both the past studies and this one indicate that farms in the 300- to 400-acre range are large enough to realize most of the economies that can arise through size at the present time.

**Average machinery investments and machinery and labor costs per \$100 of crop output for the four size groups of farms studied.**

